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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/555,295	05/26/2000	ERICH GOTTWALD	P00.0760	3797
29177	7590	05/03/2005	EXAMINER	
BELL, BOYD & LLOYD, LLC			LI, SHI K	
P. O. BOX 1135			ART UNIT	
CHICAGO, IL 60690-1135			PAPER NUMBER	

2633

DATE MAILED: 05/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/555,295

Applicant(s)

GOTTWALD, ERICH

Examiner

Shi K. Li

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 March 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 24,26,29-36,39,41,43 and 45-58 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 29 and 52-57 is/are allowed.
- 6) ☒ Claim(s) 24,26,30-36,39,41,43,45-51 and 58 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 21 March 2005 has been entered.

Claim Objections

2. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Claim 46 has been canceled in an earlier amendment filed on 12 May 2003 (dated May 7, 2003). Page 2 of that amendment clearly indicates that claim 46 is canceled. Therefore, the claim which is numbered as 46 in the current claim list is considered as a misnumbered claim.

Misnumbered claim 46 has been renumbered 58 as a new claim.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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4. Claim 58 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claim 58 recites the limitation "the prescribed condition" in lines 1-2 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 24, 26, 30-31, 33-36, 39, 41, 43, 45, 47-50 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamane et al. (U.S. Patent 5,764,404) in view of Inagaki et al. (U.S. Patent 5,745,283).

Yamane et al. discusses WDM optical amplifier and summaries the functions and operations of the invention in col. 9, line 40-col. 10, line 67. In particular, Yamane et al. teaches in FIG. 15 a method for adjusting tilting of WDM signal. Yamane et al. teaches in col. 6, lines 45-50 that tilting is caused by fluctuations in light source of optical terminal. FIG. 15 comprises optical fiber 1, WDM filter 29 and photo-sensors 30 for detecting presence or absence of optical channels, photo sensor 8 for measuring the signal level, and pump signal 2. The pump signal is controlled by a control circuit. When two or more signal levels change, due to fluctuations of light source or other optical components, or due to absence of optical channels, the control circuit adjusts the pump signal power accordingly. If the input power levels do not change, the feedback mechanism keeps the power level at the output of optical coupler 7 constant. Yamane et al. then teaches in col. 10, lines 42-54, FIG. 18 and FIG. 19 the use of two pump signals

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(pump signal and further pump signal) of different wavelengths to adjust the tilting. One of ordinary skill in the art would have been motivated to combine the various teaching of FIG. 18 and FIG. 19 with the optical amplifier of FIG. 15 because a pump signal and a further pump signal of different wavelengths give different characteristics to the amplifier, as described in col. 10, lines 43-60 of Yamane et al., therefore give better control to the tilting. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a pump signal and a further pump signal, as taught by FIG. 18 and FIG. 19 of Yamane et al., in the optical amplifier of FIG. 15 of Yamane et al. because two pump signals of different wavelengths give better control of the tilting.

Yamane et al. teaches in FIG. 19 to use a pump signal of 0.98 μm for transmission of 1.53 μm and 1.55 μm signal bands. The difference between Yamane et al. and the claimed invention is that Yamane et al. does not teach to use a pump signal with a wavelength that is greater than a maximum wavelength of each of the transmission bands. Inagaki et al. teaches in col.4, lines 15-42 that a pump signal of wavelength 1.57 μm is preferable over a pump signal of wavelength 1.48 μm . One of ordinary skill in the art would have been motivated to combine the teaching of Inagaki et al. with the modified optical amplifier of Yamane et al. because the wavelength 1.57 μm is within the amplification range of EDFA and gives wider control range. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the 1.48 μm pump signal with a 1.57 μm pump signal, as taught by Inagaki et al., in the modified optical amplifier of Yamane et al. because the wavelength 1.57 μm is within the amplification range of EDFA and gives wider control range.

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Regarding claim 45, Inagaki et al. teaches in col. 4, lines 45-53 to control the power of the light source 40 and light source 14.

Regarding claims 26, 30, 47 and 49-50, Yamane et al. discloses in col. 9, line 40-48 that the invention controls the total level of the optical output of the amplifier according to the number of optical signals of different wavelength. Accordingly, a receiver always receives each of the optical signals at a required level even if one of the optical signals is absent.

Regarding claim 31, Inagaki et al. teaches in col. 3, lines 41-45 to select the power level of the pump signals to obtain a desirable output tilting.

Regarding claim 33, Yamane et al. teaches in col. 10, lines 55-60 to equalize the different wavelength bands.

Regarding claims 34-35 and 48, Yamane et al. teaches in col. 9, lines 53-54 to control the pump power levels to keep the optical signal constant.

Regarding claims 36, 39, 41 and 43, Yamane et al. teaches in FIG. 19 the injection of one pump signal at a receiving end and one pump signal at a transmission end of the optical conductor 1.

Regarding claim 58, Yamane et al. teaches in FIG. 15 to measure power level with photo sensor 8 and adjust the excitation laser diode accordingly for compensating any change in power level.

8. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamane et al. and Inagaki et al. as applied to claims 24 above, and further in view of Onaka et al. (U.S. Patent 6,067,187).

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Yamane et al. and Inagaki et al. have been discussed above in regard to claims 24, 26, 30-31, 33-36, 39, 41, 43, 45 and 47-50. The difference between Yamane et al. and Inagaki et al. and the claimed invention is that Yamane et al. and Inagaki et al. do not adjust tilting at the receiving end of the optical conductor 1. Onaka et al. teaches in FIG. 13 an amplifier with flat tilting. Onaka et al. monitors and pumps at the receiving end of the optical conductor. One of ordinary skill in the art would have been motivated to combine the teaching of Onaka et al. with the modified optical amplifier of Yamane et al. and Inagaki et al. by monitoring and pumping at the receiving end to minimize tilting at the receiving end because tilting limits the amplification of the amplifier. With tilting, the high power wavelengths may cause saturation while the low power wavelengths do not receiving enough amplification. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to monitor and control the tilting at the receiving end of the optical conductor, as taught by Onaka et al., in the modified optical amplifier of Yamane et al. and Inagaki et al. because a minimal tilting allows the maximum amplification from the amplifier.

9. Claim 51 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamane et al. and Inagaki et al. as applied to claims 24 above, and further in view of Chikuma et al. (U.S. Patent 6,055,093).

Yamane et al. and Inagaki et al. have been discussed above in regard to claims 24, 26, 30-31, 33-36, 39, 41, 43, 45 and 47-50. The difference between Yamane et al. and Inagaki et al. and the claimed invention is that Yamane et al. and Inagaki et al. do not include an amplifier at a transmitting portion. Chikuma et al. teaches in FIG. 3 an optical amplification apparatus with an amplifier at the receiving portion of the optical conductor and an amplifier at the transmitting

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portion of the optical conductor. One of ordinary skill in the art would have been motivated to combine the teaching of Chikuma et al. with the modified optical amplifier of Yamane et al. and Inagaki et al. because additional amplifiers further boost the signal level and allow the signal to be transmitted over a long distance. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a transmitting portion with an amplifier to further boost the signal level, as taught by Chikuma et al., in the modified optical amplifier of Yamane et al. and Inagaki et al. because a high signal level allows the signal to be transmitted over a long distance.

Allowable Subject Matter

10. Claims 29 and 52-57 are allowed.

Response to Arguments

11. Applicant's arguments filed 21 March 2005 have been fully considered but they are not persuasive.

The Applicant argues that Yamane does not teach the feature of "injecting at least one pump signal and at least one further pump signal into the optical conductor when at least two signal levels of the measured signal levels of at least one of the plurality of transmission bands are changed or absent from the transmitted broadband optical signal causing said tilting" recited in claim 24. The Examiner disagrees. Yamane teaches in col. 6, lines 45-50 that tilting is caused by fluctuations in light source of an optical terminal. Yamane further teaches in FIG. 15 and col. 11, lines 12-21 that the photo sensors detect presence or absence of optical signals. Yamane then teaches in col. 10, lines 42-54, FIG. 18 and FIG. 19 the use of two pump signals (pump signal and further pump signal of claim 24) of different wavelengths to adjust the tilting. Therefore,

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Yamane teaches said limitation of claim 24. The combination of Yamane and Inagaki et al. teaches the other limitations of claim 24 and the rejection of claim 24 is proper

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shi K. Li whose telephone number is 571 272-3031. The examiner can normally be reached on Monday-Friday (8:30 a.m. - 5:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

skl
27 April 2005



Shi K. Li
Patent Examiner